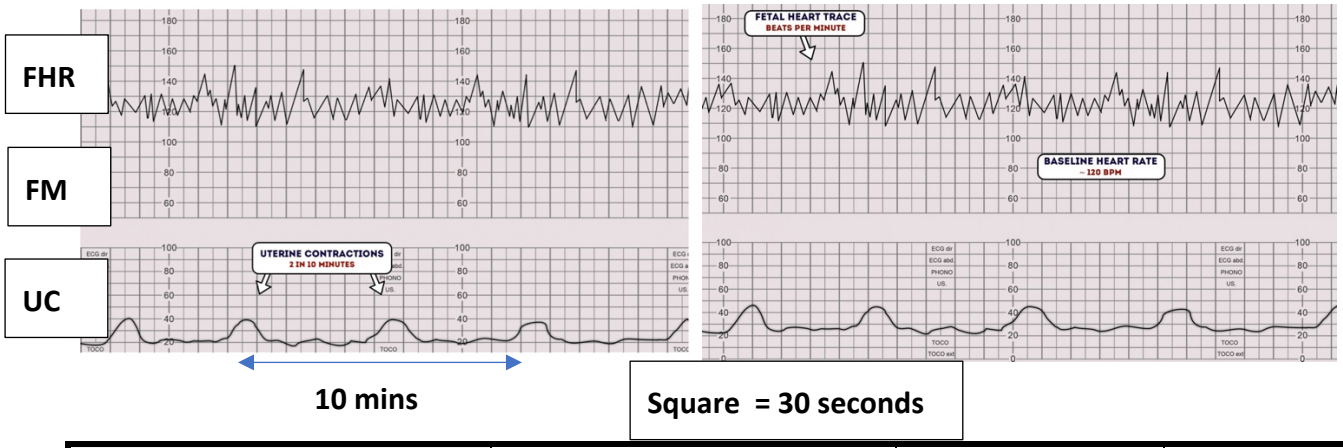
Cardiotocography (CTG) (DRs BRaVADO)

monitor fetal heart rate and uterine contractions during pregnancy



Check:

- Correct PT
- Rate at recording (usu. 1cm = 1min)

DR: Define risk

"when to upgrade from intermittent auscult → CTG?"

Maternal	Placenta	Fetus
• GDM	• Placenta accrete	• IUGR
• Gestational HTN	• Placenta abruption	• Mec-stained liquor
• Pre-eclampsia	• Placenta infarction	• Congenital malformation
• Substance abuse		• Reduced FM
• Previous pre-term, LSCS		• Oligohydramnios – cord compression
• Post-EDD		
• Vasculitis (SLE)		
• Chronic disease (CHD, COPD, T1DM)		

C: Contractions

of contractions in 10min

- 1 large box = 1min
- ***DDx*** = Braxton-hicks (non-painful, irregular) vs Pre-labour contraction (painful + cervix changes)
- ***XS contractions ➔ stop syntocinon immediately***

BRa: Baseline rate:

Ave. HR of the **fetus** in 10min where no uterine contraction / acc/ decl

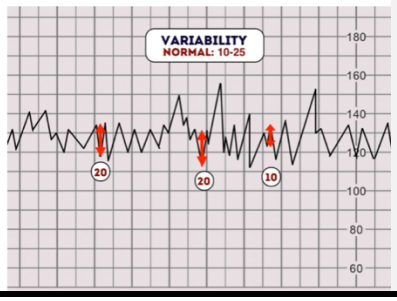
- Normal = 110-160bpm)
- SNS driven

FHR changes Mx: POISON ER

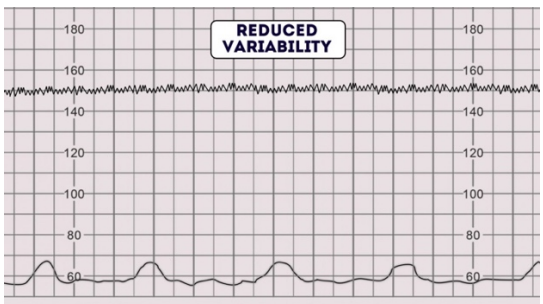
1. Check own and maternal **pulse**
2. Position
3. FiO2 100%
4. IVF – correct hypoTN
5. Scalp electrode, pH, lactate (pH <7.2 = FETAL ACIDOSIS = ED LSCS)
6. Oxytocin stopped
7. Need help
8. Exam – vagina (cord prolapse)
9. Exc. fever, shock, premature, drugs

V: Variability

Variation of **fetal** **HR after each beat** (*controlled by ANS, cardioreceptors, baroreceptors, chemoreceptors*)



	Fetal tachycardia	Fetal bradycardia	Reduced var	Increased var
Non-reassuring	> 160bpm	< 110 bpm	< 5 bpm for between 30-50 mins	> 25 bpm for 15-25 minutes
Abnormal	> 180bpm	<100 bpm	< 5 bpm for > 50 minutes	> 25 bpm for > 25 minutes [sinusoidal]
Maternal	• Fever • Hyperthyroidism • Anaemia • Dehydration	• Hypothermia • hypoTN • hypoglycemia • umbo cord occlusion	• Infection • Dehydration	•
Fetal	• Arrythmia • Anaemia • Infection • Congenital anomalies	• Rapid descent • Heart block • Vagal stimulation (head compression) • Hypothermia • Acidosis	• **Inactivity / sleeping** • CNS anomalies • Dysrhythmia • Pre-term fetus	•
Utero-placenta	• Early hypoxia (abruption, HTN) • Chorioamnionitis	• Late hypoxia • Acute cord prolapse • Hyper contractility	• hypoxia	• hypoxia • cord compression
Drugs	• SNS stimulants	• BB • Anaesthetics	• Narcotics (opiate) • Sedatives • BB, • $MgSO_4$	•



Compared to intermittent auscultate , CTG:

1. ↓neonatal seizures
2. ↑LSCS
3. ↑Instrument device
4. No benefit to low risk women and does not improve CP, perinatal death

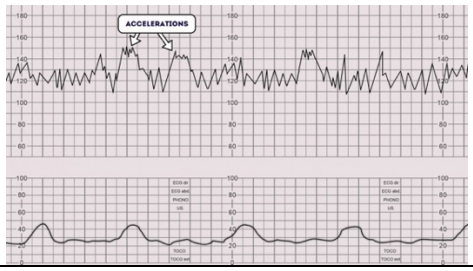
CLINICAL PEARLS:

- ANY uterine contraction < 32GA is ABNORMAL
- BP generally is lower (HR is higher to maintain adequate cardiac output)

A: Accelerations (normal)

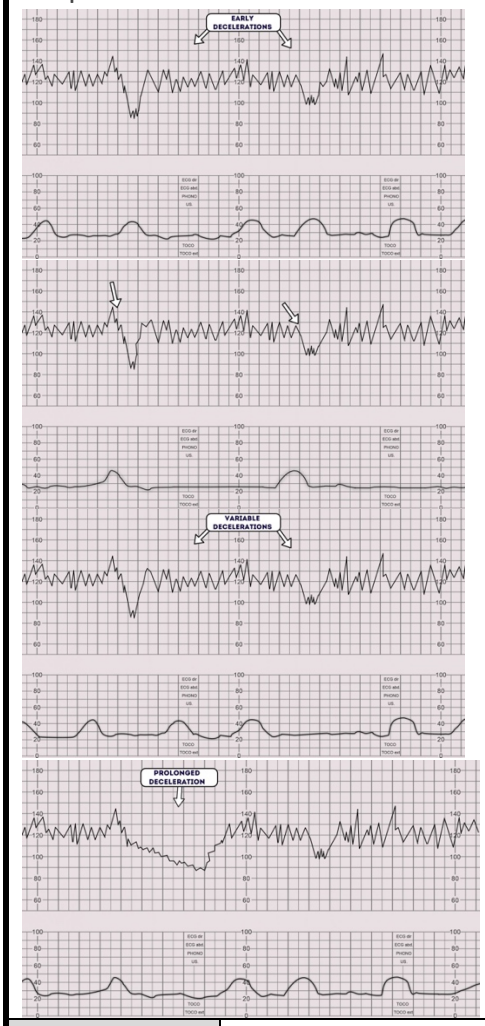
Abrupt increase in the **baseline fetal HR** of **> 15 bpm** for **> 15s**

- **Accelerations + alongside uterine contractions = a healthy fetus**
- **Absence** of **accelerations + normal CTG = of uncertain significance.**



D: Decelerations

Abrupt decrease in the **baseline fetal HR** of **>15 bpm** for **> 15s**



VEAL → CHOP

	Features	Significance
Variable decels	*Rapid fall in baseline w/ variable recovery phase*	*Umbo cord compression – occluded umbo vein causes initial accel and subsequent occluded umbo artery causing decel*
Early decelerations (physiological)	**BEGIN** when **uterine contraction begins** and **recover** when **uterine contraction stops**	**Head compression** ↑ uterine contraction = ↑ fetal ICP = ↑vagal tone
Accelerations	***Normal***	***Good***
Late decelerations	begin at **peak of uterine contraction** and **recover after contraction ends**	***Utero-placental insufficiency due to:*** • **Hypoxia in fetus** • Maternal HypoTN or hypoxia • Pre-eclampsia • Uterine hyperstimulation
Sinusoid (rare)	• **smooth**, **regular**, **wave-like** pattern • **No** beat to beat variability	high fetal morbidity and mortality • Severe fetal hypoxia • Severe fetal anaemia • Fetal/maternal haemorrhage (e.g. vasa praevia)
Shoulders of deceleration	**accelerations before** and **after** a **variable deceleration**	fetus adapting to reduced blood flow (not yet hypoxic) ➢ no shoulder = hypoxic fetus
Prolonged deceleration	deceleration > **2 minutes**	If it lasts **between 2-3 minutes = non-reassuring** **> 3 minutes = abnormal**

BEWARE OF VARIABLE DECELS:

Assuring	Non-reassuring	Abnormal
Abrupt **decrease** in **the** baseline fetal **HR** **of** >15 bpm **for** > 15s	Variable decelerations w/ • **no concerning characteristics for ≥ 90 mins** • any concerning characteristics in 50% of contractions for 30mins • **late dec in > 50% of contractions in < 30mins** (w/ no maternal or fetal clinical risk factors such as vaginal bleeding or significant meconium)	• > 60 seconds • ↓ baseline variability within the deceleration • Failure to return to baseline • Biphasic (W) shape • No shouldering

O: Overall impression

- **Assuring**
- **Non-reassuring**
- **Abnormal**

Mx

DFM/Stillbirth action plan
(for single pregnancies > 28 GA)

	Action	Obstetric review?
Initial response	Any women reporting FM concern ➢ Abdo palp, H+E, SFM, auscultate	
Clinical assessment	• CTG + hx + exam • Check RF for still birth	No fetal heartbeat detected
CTG	Normal + no RF + 1st DFM presentation + no maternal concerns = no further Ix	Abnormal CTG (e.g. BR, decel, reduced variability)
Further Ix	• USS ASAP • Fetal maternal haemorrhage test (Kleihauer) → determine amount of fetal blood in maternal bloodstream • Fetal scalp electrode / blood sampling	• Abnormal USS • FMH > 1mL
Birth plan	Individualised – aim birth after 39 wks ➢ Do they need ED LSCS? ➢ Prepare for PPH ➢ Anti-D in Rh -ve mothers	
Mx	ED LSCS + prepare for PPH ➢ Transfusion, inotropes, Lasix	

Risk factors for stillbirth

- Maternal age >35 years
- Maternal smoking
- Overweight and obesity
- Nulliparity
- Assisted reproductive technology
- Alcohol and other drug use
- Aboriginal or Torres Strait Islander, Pacific, African and South Asian ethnicities
- No antenatal care
- Low education
- Low socioeconomic status
- Previous stillbirth
- Pre-existing diabetes
- Pre-existing hypertension
- Pre-eclampsia
- Small for gestational age (<10th centile)
- Post term pregnancy (>41 weeks)

RULES OF 3'S for prolonged bradycardia

- ➢ 3 mins = call for help
- ➢ 6 mins = go to OT
- ➢ 9 mins = prepare for delivery
- ➢ 12 min = delivery baby by 5mins